Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) A method of selecting chemical grade silicon metalloid having improved yield in the direct process for making organohalosilanes, in which an organohalide is reacted with silicon metalloid in the presence of a copper catalyst at an elevated temperature, the method comprising:

(A) measuring the temperature of a batch of silicon metalloid during both the refining and the casting of the silicon metalloid; (B) measuring the elemental impurity levels in the batch of the silicon metalloid; (C) predicting the properties of slag produced during refining of the silicon metalloid based on equilibrium calculations using the elemental impurity levels and the measured temperatures of the batch of silicon metalloid; and (D) selecting a chemical grade silicon metalloid for use in the direct process for making organohalosilanes such that the predicted slag density is at least 0.02 gram per cm^3 higher than the density of the batch of chemical grade silicon at the casting temperature, the predicted slag viscosity is at least 35 poise at the casting temperature, and the predicted melting point of the slag is lower than the temperature during refining of the batch of chemical grade silicon and using the selected chemical grade silicon metalloid in the direct process for making organohalosilanes.

2. (Original) A method according to Claim 1 in which the organohalosilanes include dimethyldichlorosilane and the chemical grade silicon metalloid is selected to favor the production yield of dimethyldichlorosilane.

3. (Cancelled)

4. (Cancelled)

5. (Original) A method according to Claim 1 in which the predicted slag density is at least 0.04 gram per cm^3 higher than the density of the batch of chemical grade silicon at the casting temperature.

6. (Cancelled)

7. (Original) A method according to Claim 1 in which the predicted slag viscosity is at least 40 poise at the casting temperature.

8. (Original) A method according to Claim 1 in which the predicted slag viscosity is at least 50 poise at the casting temperature.

9. (Cancelled)

10. (Currently Amended) A method of production of silicon, in which quartz (SiO_2) is carbothermally reduced in an electric arc furnace, refined, and cast, the method comprising
(A) controlling the temperature of silicon during both the refining and the casting of the silicon;
(B) controlling the elemental impurity levels in the silicon after refining of the silicon;
(C) predicting the properties of slag produced during refining of the silicon based on equilibrium calculations, using the elemental impurity levels and the measured temperature of the silicon; and
(D) selecting the silicon for use in ~~the~~ a direct process such that the predicted slag density is at least 0.02 gram per cm^3 higher than the density of the batch of chemical grade silicon at the casting temperature, the predicted slag viscosity is at least 35 poise at the casting temperature, and the predicted melting point of the slag is lower than the temperature during refining of the batch of chemical grade silicon.

11-17. (Cancelled)